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## A STRONG MOTIVATION FOR ARITHMETIC WORK

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CASSIE L. PAINE  
Boston, Massachusetts

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In a certain school, a class of twelve sixth-grade children were allowed to work in a group by themselves. These children were not defective mentally, but were somewhat slow and indolent, and had little in their home life to stimulate vigorous intellectual activity. They had lagged more or less through the grades, all having failed of their last promotion, and several having failed at other times. They were generally deficient in all school subjects and particularly deficient in arithmetic and language.

In attacking the problem of having the children make up their deficiencies, there seemed to be two courses that might be pursued. One was to compel each child by coercion to complete a minimum amount of the required work, and another way was to arrange situations so that the children would see the need of obtaining knowledge, and therefore have a desire to do so.

The arithmetic work was at the stage where the four fundamental operations in common fractions, decimal fractions (U.S. money), and denominate numbers should be fixed. Problems of two or three steps involving these operations should be interpreted and performed, and the subject of percentage begun. The children disliked the ordinary drills in reading and writing decimals, in computing fractions, etc., and frankly said so. When given a problem involving reasoning, they began to work on it with no intelligent interpretation of its purpose, and half-heartedly tried one operation after another until in some way or other the correct answer was obtained.

The idea was conceived that if those children could realize the value in their own daily lives of accurate and intelligent computation, it would give them an incentive to acquire the necessary information. It was therefore decided to let them practice running a grocery store, and get the motive for their work in arithmetic

that way. The plan was laid before the children and they entered into it with great enthusiasm.

The place selected for the store was a set of shelves upon which the schoolroom supplies were kept. It involved considerable work to move these supplies to other places, to clean the shelves, to find and hang curtains to cover the unused part, etc. But the children were willing to take any amount of time out of school hours and to go to any trouble for this purpose. Several firms, such as the National Biscuit Co., The Sunshine Biscuit Co., Heinz Pickle Co., were reported to be very willing to furnish samples of goods, empty cartons, etc., to schools to be used in this way. Consequently, the children were allowed to write to the several firms in regard to the matter. This was excellent practice in writing business letters.

As there was considerable delay in getting the goods, the children suggested that they bring things from their own homes to use while waiting for the others. This was allowed, and the accompanying photograph shows the result. Without direction from the teacher in charge, the children brought empty bottles, boxes, cans, etc., from their homes, mended the mutilated places, filled the transparent receptacles with materials that were similar in appearance to the original contents, wrote the prices in inconspicuous places, and arranged the goods on the shelves as in the picture. A money drawer was made, and measures and baskets of various kinds were procured.

The children decided upon the name of their store and made the sign. In order to do this, accurate measurements had to be taken and followed; rather careful arithmetical computations were also necessary in order to divide the space correctly. In the manual-training room, the boys made blocks of wood to represent cakes of soap to fit various soap wrappers that were brought. Wooden yeast cakes were also manufactured in the same way. A file was made for the sale slips and a hook upon which to hang the paper bags. The head of a butter firkin was covered with yellow paper, to represent butter and a block of wood covered with the same material represented the piece to be sold. For the sale slips a long strip of paper that came from a roll of ribbon was folded



into uniform-sized pieces, and put into a box, through the cover of which one end protruded.

In order to keep up with the market prices, the children were obliged frequently to interview the various near-by grocers for the latest prices of the goods they carried. A slate was brought from one of the playrooms at home, upon which some child arranged and printed daily a price list that was hung in sight for the convenience of the customers. The children took turns in being storekeeper, bookkeeper, and store boy, and could actually "deliver the goods" in return for (toy) money. The other children, and frequently the teachers, were customers, and often a rather knotty problem in fractions would occur as a result of the transactions.

The storekeepers usually gave a discount for cash payments, and occasionally there would be discounts on all the sales during a limited period of time. Special sales for certain days were arranged and announced, as the accompanying photograph shows. Here the practical work in accurate computations in decimal fractions, in profit and loss, and in percentage took on a real meaning, and it was very interesting to see how seriously the children discussed the pros and cons of selling the different articles at a reduction.

The wholesale side of storekeeping was also attacked, and this involved work with larger numbers. The children took an inventory of goods on hand, and made an invoice of goods (that might have been) received from other firms. They planned a "supply" garden and made an estimate of the new stock for the store that might reasonably be expected from the garden. They kept weekly accounts of the running of the store, and reckoned up their "financial standing" every Friday.

All this represented the interesting "play" side of the work, but the educational problems did not stop there. After actually going through the bargaining at the store, each child wrote out his individual transaction in the form of a problem. This problem at a later date was given the other members of the class to do. This gave the children an intelligent appreciation of the purpose of a problem, and it formed an apperceptive basis for the interpretation of other arithmetical problems. It also gave the children needed practice in stating clearly the main facts of the trans-

# South Salem

## GROCERY

### SPECIAL SALE

Jar of Jelly ..... 25¢  
 Strictly Fresh Eggs ..... 27¢  
 Canned Apples ..... 13¢  
 Pickles ..... 22¢  
 Sugar 2 LBS ..... 12¢  
 Tea a LB ..... 43¢  
 Canned Fish 3 Boxes ..... 25¢

With Every  
 Purchase  
 of Jelly  
 Box of Soap

South Salem Grocery  
Marblehead Road

### SPECIAL SALE!!!!

Jelly ..... 25¢  
 Per Jar  
 1 box of soap with each purchase

Strictly fresh eggs ..... 27¢  
 Regular price 30¢

Star Brand Evaporated Apple ..... 13¢  
 Regular price 15¢

Granulated sugar 2 lbs for ..... 12¢  
 Regular price 13¢

Canned Fish 3 boxes for ..... 25¢  
 Regular price 27¢

All 3¢ coffee cut down to ..... 32¢  
 Best quality of Tea ..... 43¢  
 Regular price 45¢

action. Below are some of the problems made out by the children in this way.

I went to the store and bought  $1\frac{1}{2}$  lbs Confectioner's sugar @ 8 ¢ lb.  $1\frac{1}{2}$  lbs Brown sugar @ 7 ¢ lb. 5 lbs granulated sugar @  $6\frac{1}{2}$  ¢ lb. Find total cost. How much change will I receive from \$2?

On a Bargain Day I bought 3 lbs butter at  $34\frac{1}{2}$  ¢ 4 boxes of Butter thin @  $9\frac{1}{2}$  ¢. They allowed 10% on cash.

A woman bought 1 can cocoa @ 22 ¢ and 2 qts. milk @ 8 ¢ qt. She gave the clerk \$1 and received \$.72 in change. How much extra change did she receive?

If 2 boxes of butter thins cost 10 ¢ per box and  $\frac{1}{2}$  lb of butter at \$.35 per lb. Cost?

If I pay the bill at once he will give me a discount of 7 per cent and I give him a ten dollar bill what was the change I got back?

If I go to the store with a dollar bill and buy 1 can of Tea @ 45 ¢, and 1 can of Baking Powder @ 25 ¢, 2 pounds of Sugar @ 13 ¢, 1 doz. Eggs 33 ¢, and 1 pkg Quaker Puffed Rice 10 c. How much more did I owe him.

Find the cost:

1 bag salt	@	.10
1 box candy	@	.35
1 box Uneeda	@	.05
1 box White House coffee	@	.25 can
Change from 1.00		

I went to the store and bought 1 bottle Ammonia @ 10 ¢ bottle, 1 can Baker's Cocoa @ \$.22 can, 1 pkg. Quaker Oats @ \$.10 pkg., 1 bottle Malted Milk @ \$ .25 ¢ bottle, 1 pkg. Not-A-Seed raisins @ \$.10 ¢ pkg. and 1 doz. eggs @ \$.33 doz. How much will I pay after 10 per cent has been taken off?

If I buy 1 box of chocolates at 1.00, and a Jar of Jam at .25, an a can of sugar of Milk at \$.33,. How much will I pay if I get 3 per cent off from all the goods that I have bought.

The running of the store gave material for some of the written work in English. The children usually disliked writing compositions, but these copies of their first drafts will show how spontaneously they could write when the subject was something in which they were really interested.

## OUR GROCERY STORE

EVERETT

April 11, 1912.

We started a store in our room. All of us children brought boxes from home, and stuck them together with mending tissue and after we had a great many boxes. One day Aruthur and I came in early and put the store in condition. Miss P. came in and she thought it just grand. She asked us if we evered decorated a window in a store. We opened our store Tuesday morning at nine o'clock. I was the keeper the first day. We had a price list on our goods. The children were the customers. The gave me the money and I gave them the change. We made problems from what we bought.

## OUR GROCERY STORE

EDITH

April 17, 1912.

The first thing we did was to send letters to the large biscuit companies. We have not received any thing yet. The store is in the front of the room. Mr. W. took some pictures of it. We have paper money. The store is open at nine o'clock. There are chocalates, cocoa, Quaker oats, malted milk and a grate many more things that I can not name. Everrett was the first store-keeper. Miss P. has been in and bought things. Our store is called the "South Salem Grocery Store." Each one of us made one or to letters. It was open April 1, 1912.

## OUR GROCERY STORE

ARTHUR

April 16 1912

We sent to three different places for sanple boxes and not receiving any, we brought boxes from home. We cleared off the shelves and Everett and I placed the boxes on the shelves. We opened the store the second day of April. Everett was the store keeper. We each bought something, and then Miss P. came in and bought something. We made up examples on the good we bought. We are making a sign. The name of the store is the South Salem Grocery Store.

## OUR GROCERY STORE

AUGUSTE

april 12 1912

We wrote to the National Biscuit Co to have some sample boxes of biscuit be did not have any answer so we bought things from home, empty boxes of Uneeda biscuit, Baker's cocoa, Baking powder and other things. Everett and Arthur fixed the things on the shelvs and now we buy things.

I was store keeper the first day. I knew how to run a store because i had one last summer. When they bought for a big sum I allowed discount, and



then we made problem. We use paper money. I enjoyed very much my first day in the store. The name of our store is South Salem Grocery Store. We made our own letters and we pasted them on the paper. We had the picture taken and it came out good.

(These problems and compositions are exact copies of the children's uncorrected first drafts. They are given, not to show accuracy of form, but evidence of thought on the part of the writers.)

It would be almost impossible to tell of the different ways in which the children showed the benefit of this kind of *live* arithmetic work. In the first place, they had a genuine desire to attend school and to work after they got there. They could exercise their creative ability in providing make-believe goods. They had practice in transacting business courteously. They gained much in speed and accuracy of computation without pencil and paper. They acquired confidence and intelligence in stating their wants and in judging the value of what they received. They had a feeling of responsibility in the care of the store, and saw the value of neatness, order, attractive arrangement of goods, etc. They realized the necessity of knowing how to write business letters, make out bills, receipts, and various other common business forms. They saw the importance of clear, legible writing and printing. They had the satisfaction of being able to state and perform problems, the conditions and results of which were concrete and actual. In their written English periods they had something to write about and a desire to make what they wrote interesting. But, perhaps, best of all, was the joy they experienced in originating ways of supplying actual needs. These children had never before had the feeling that their contributions to a class were of much use. Now they saw the actual value of what they could give, and this knowledge gave them a hitherto unknown feeling of encouragement and confidence in themselves.